

MD SAHABUL HOSSAIN

GRADUATE RESEARCH ASSISTANT

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Education

University of New Mexico, USA

August 2021 – December 2024 (Expected)

Ph.D., Department of Electrical and Computer Engineering

• **Laboratory:** [Performance and Resource Optimization Lab \(PROTON Lab\)](#)

• **Research Interest:** Wireless Communication and Networks, Network Economics, Artificial Intelligence, Cybersecurity, Electric Vehicles

University of New Mexico, USA

August 2021 – December 2023

M.Sc, Computer Engineering

• **Laboratory:** [Performance and Resource Optimization Lab \(PROTON Lab\)](#)

• **Research Interest:** Alternative Positioning, Navigation and Timing, Wireless Communication and Networks, Network Economics, Artificial Intelligence

• **Thesis:** Location Aware Task Offloading Framework for Edge Computing Empowered by Reconfigurable Intelligent Surfaces

Islamic University of Technology, Bangladesh

December 2011 – November 2015

B.Sc, Electrical and Electronic Engineering

• **Research Interest:** Waveguide and Optical Filter Designing, Application of Finite Difference Time Domain Method, Artificial Intelligence

Research Experience

Graduate Research Collaborator

February 2022 – Present

Project: EVs@Scale

Sandia National Laboratories

Funded by the [DoE](#). Contributions are hosted in NREL's private GitLab Cyber Range server.

Research team consists of researchers and collaborators from both SNL and NREL

Contributions:

- Assessed PKI based Plug & Charge security for ISO 15118 capable EV charging infrastructure.
- Identified vulnerability and security posture of the implemented Plug & Charge (PnC) system.
- Enhanced [SwitchEV](#) implementation of ISO 15118 and [The Mobility House](#) implementation of OCPP by adding OSCP capabilities with DigiCert digital certificates.
- Enabled scalability testing of EV charging system by deploying system components (EVs, charging stations, PKI CAs) as virtual machines using SNL developed VM management tools [Minimega](#) and [Phenix](#).
- Performed SIL tests of the [EVerest](#) EV charging software stack.
- Performed HIL tests by establishing successful EV charging sessions with [Pionix's BeleyBox](#) and [ChargeByte's CCL](#) hardware.

Related hard skills:

Python, Go, Shell script, Linux, Docker, GitLab, Virtual machine management, Embedded system, Cybersecurity, PKI, ISO 15118, OCPP, SIL and HIL testing

Graduate Research Assistant

August 2021 – Present

Performance and Resource Optimization Lab (PROTON Lab)

University of New Mexico

Research goals:

- Finding ground based alternative solutions to positioning, navigation and timing services (PNT).
- Optimizing cyber-physical networks using network economic, game theoretic and machine learning models.
- Securing cyber-physical systems with public key cryptography and blockchain.
- Investigating and designing vehicle-to-vehicle energy trading protocol.

Related hard skills:

Python, Shell script, Linux, Cybersecurity, PKI, Blockchain, Smart contracts, Geth, Truffle, Reinforcement learning, Game theory, Mathematical optimization

Teaching Experience

Lecturer

October 2016 – July 2021

Department of Electrical and Electronic Engineering

Bangladesh University of Business and Technology

Courses taught:

- Structured Programming Language (Theory and Lab)
- Numerical Analysis for Engineers (Theory)
- Microprocessor and Interfacing (Theory and Lab)
- Introduction to MATLAB (Lab)
- Mobile Cellular Communication (Theory)
- Digital Signal Processing (Theory and Lab)

Responsibilities:

- Prepared and conducted nine 1-hour theoretical lectures (40 – 60 students) and three 3-hour laboratory sessions (30 – 40 students) per week.

Intake In-charge

2018 – 2021

Department of Electrical and Electronic Engineering

Bangladesh University of Business and Technology

Responsibilities:

- Helped three intakes of students with course registrations and acted as their academic advisor.

Member of Routine management Committee

2019 – 2021

Department of Electrical and Electronic Engineering

Bangladesh University of Business and Technology

Responsibilities:

- Together with other members of the committee made academic routines for the department of Electrical and Electronic Engineering.

Member of Question Moderation Committee

2019 – 2020

Department of Electrical and Electronic Engineering

Bangladesh University of Business and Technology

Responsibilities:

- Moderated mid-term and final examination question papers of electronics major courses.

Peer Reviewing Experience

Technical Program Committee (TPC) Member

IEEE Conferences

- [IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids 2023](#), Glasgow, Scotland.

Peer Reviewer (Verified by [Web of Science](#))

IEEE Conferences

- 3 Papers - [IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids 2023](#), Glasgow, Scotland.
- 2 Posters - [IEEE Symposium on Computers and Communications 2022](#), Rhodes Island, Greece.
- 2 Demos - [IEEE Symposium on Computers and Communications 2022](#), Rhodes Island, Greece.
- 1 Paper - [IEEE International Symposium on World of Wireless Mobile and Multimedia Networks 2022](#), Belfast, United Kingdom.

Skills

Programming: Python, C, C++, Go, JavaScript, Solidity, MATLAB, PHP, SQL, VHDL

Software/Libraries/Tools: Deep learning (Keras, Tensorflow, Scikit-learn), Reinforcement Learning (Stable Baselines, OpenAI Gym), MATLAB Simulink, Network Simulation (NS3), Blockchain (Geth, Truffle), FPGA (Xilinx Vivado), Virtual machine management (Minimega, Phenix), Version controlling (GitHub, GitLab), Electric vehicle charging software-in-the-loop (SIL) testing (EVerest, MaEVe, SteVe, SwitchEV iso15118), Linux OS, Docker

Hardware: FPGA (Zybo Z7), Electric vehicle charging hardware-in-the-loop (HIL) testing (PIONIX Be-layBox, ChargeByte Charge Control L)

Other skills: Research and open data aggregation, Data cleaning and processing, Data visualization, Collaborative project management, Electric vehicle charging protocol (ISO 15118-2, ISO 15118-20, OCPP), Public Key Infrastructure, Cybersecurity

Journal Publications

- **M.S. Hossain**, N. Irtija, M. Diamanti, F. Sangoleye, E.E. Tsiropoulou, and S. Papavassiliou, “Reconfigurable intelligent surfaces-enabled edge computing: A location-aware task offloading framework”, *ITU Journal on Future and Evolving Technologies*, 2022. DOI: [10.52953/FLTJ9889](#)
- M. Hasan, F. Maoya, **M.S. Hossain**, R. Ahmed, M. Hossain, K. Ali, and S. Islam, “Plasmonic corrugated waveguide coupled to a rectangular nano-resonator as an optical filter”, *OSA Continuum*, 2020. DOI: [10.1364/OSAC.403762](#)

Conference publications

- M. S. Siraj, **M. S. Hossain**, R. Brown, E. E. Tsiropoulou, and S. Papavassiliou, ”Incentives to learn: A location-based federated learning model,” in *2022 Global Information Infrastructure and Networking Symposium (GIIS)*, pp. 40–45, 2022. DOI: [10.1109/GIIS56506.2022.9937034](#)
- **M.S. Hossain**, F. Sangoleye, O. Poudyal, and E.E. Tsiropoulou, “Network Economics-enabled Edge Computing in UAV-assisted Public Safety Systems”, *18th Annual International Conference on Distributed Computing in Sensor Systems, DCOSS 2022*. DOI: [10.1109/DCOSS54816.2022.00067](#)
- F. Sangoleye, **M.S. Hossain**, E.E. Tsiropoulou, and J. Plusquellic, “Network Economics-based Crowdsourcing in UAV-assisted Smart Cities Environments”, *18th Annual International Conference on Distributed Computing in Sensor Systems, DCOSS 2022*. DOI: [10.1109/DCOSS54816.2022.00030](#)
- **M.S. Hossain**, N. Irtija, E.E. Tsiropoulou, J. Plusquellic, and S. Papavassiliou, “Reconfigurable Intelligent Surfaces enabling Positioning, Navigation, and Timing Services”, *IEEE International Conference on Communications*, 2022. DOI: [10.1109/ICC45855.2022.9838473](#)

Honors and Awards

ECE Outstanding Graduate Student <i>School of Engineering, University of New Mexico</i>	2024 <i>Albuquerque, USA</i>
OIC granted scholarship for undergraduate study <i>Islamic University of Technology</i>	2011 – 2015 <i>Gazipur, Bangladesh</i>
Government Scholarship in HSC examination <i>Education Board of Bangladesh</i>	2011 – 2015 <i>Bangladesh</i>
Government Scholarship in SSC examination <i>Education Board of Bangladesh</i>	2010 – 2011 <i>Bangladesh</i>

Achievements

Champion <i>Divisional Stage, 4th National Chemistry Olympiad</i>	2011 <i>Bangladesh</i>
Champion, Higher secondary category <i>Divisional Stage, 9th National Math Olympiad</i>	2011 <i>Bangladesh</i>
Champion, Secondary category <i>Divisional Stage, 7th National Math Olympiad</i>	2009 <i>Bangladesh</i>
Champion, Junior category <i>Divisional Stage, 5th National Math Olympiad</i>	2007 <i>Bangladesh</i>